

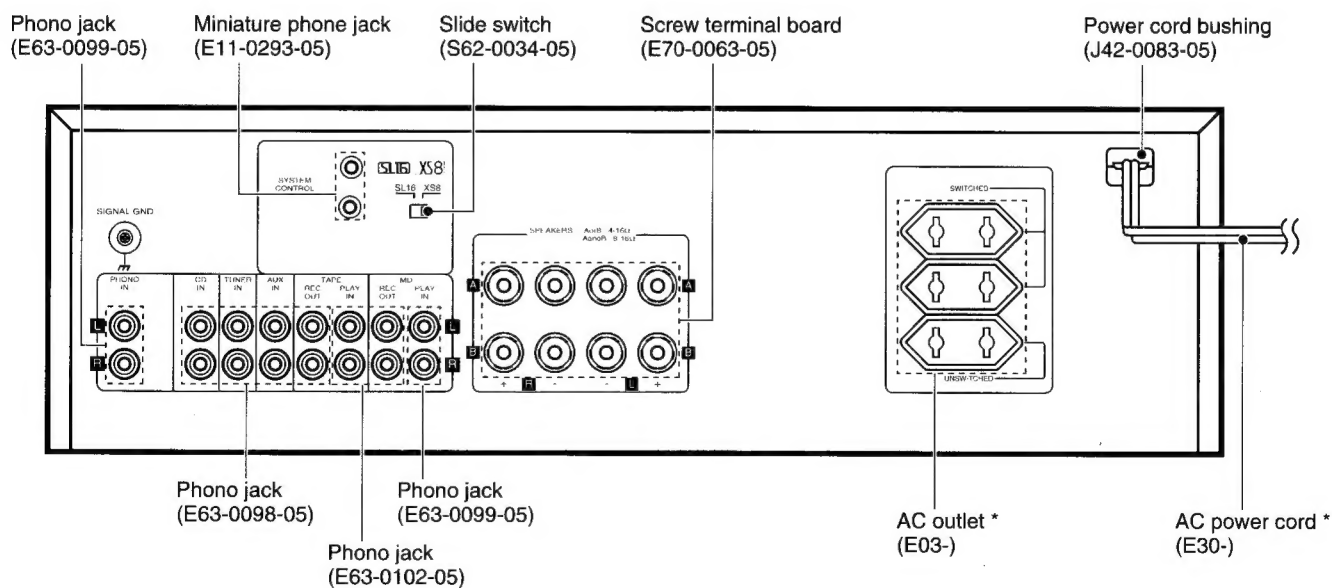
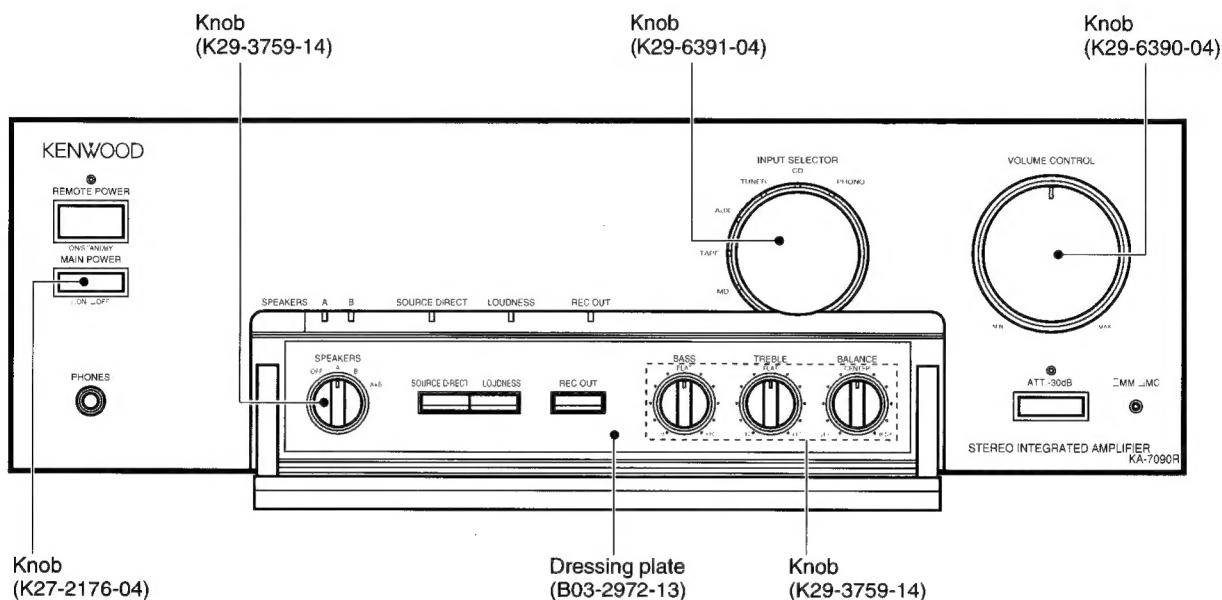
STEREO INTEGRATED AMPLIFIER

KA-7090R

SERVICE MANUAL

KENWOOD

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* Refer to parts list on page 26.

KA-7090R

CONTENTS / ACCESSORIES

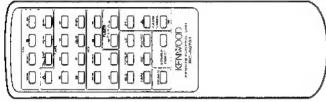
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Accessories

Remote control unit.....(1)
(A70-1079-05)

Batteries.....(2)



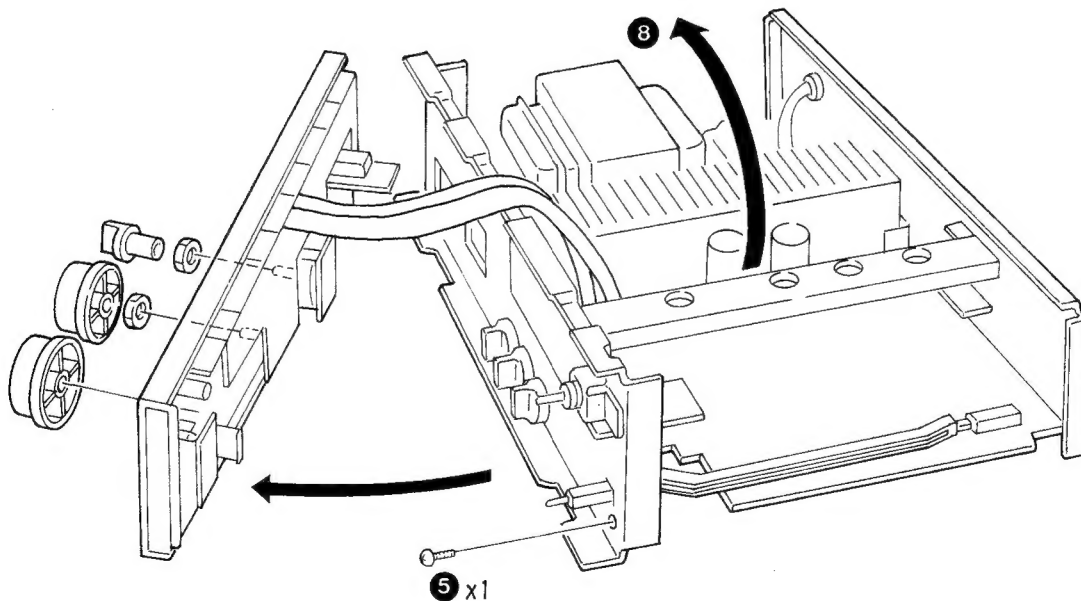
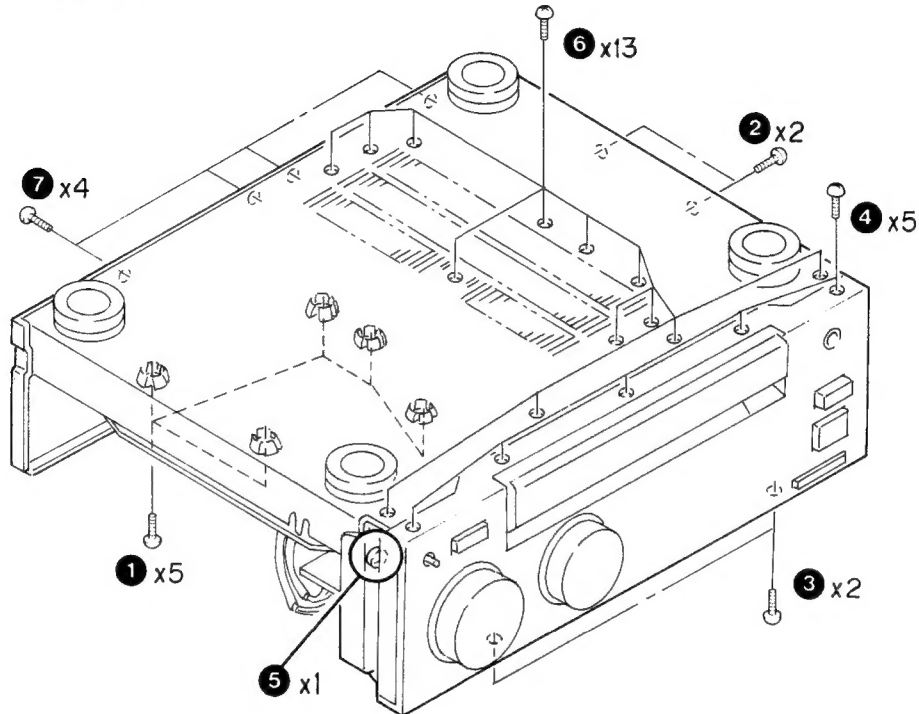


Battery cover (A09-0170-08)

DISASSEMBLY FOR REPAIR

HOW TO REPLACE POWER TRANSISTOR

1. Remove 5 screws (1) fixing audio pcb (X09).
2. Remove left side screws (2).
3. Remove panel top screws (3), panel bottom screws (4) and fram screw (5).
4. Remove bottom screws (6), rear screws (7) and bottom plate.
5. Lift unit to arrow direction (8). (Power transformer is bottom side)
6. Replace power transistors.



CIRCUIT DESCRIPTION

1. FUNCTION

(1) FEATURE

* K's is Japanese market only.

	COMPO(KA-7090R)	K's *
AUDIO INPUT	TAPE, MD, CD, AUX, TUNER, PHONO	
REC OUT	TAPE→MD, MD→TAPE CD, AUX, TUNER, PHONO	
DIRECT	SOURCE DIRECT	× SOURCE DIRECT CD DIRECT
LOUDNESS	○	○
MD/MONITOR	×	○
REMOCON	○	○
SYSTEM CONTROL	○ (8/16)	○ (16)
MOTOR VOLUME	○	○
HEADPHONE	○	○
SPEAKER	A / B / A+B / OFF	A / B / A+B / OFF
BACK UP	○	○

2. MODEL CONDITION

			PORT2 (SERIAL / MODEL)	
			H	L
PORT1	H	COMPO (KA-7090R)	SERIAL 8 bit	SERIAL 16 bit
(MODEL)	L	K's	KAF-7002	KAF-5002

3. INITIALIZING FUNCTION

3-1. Initializing Operation

- Insert the AC power (set the POWER key to ON) for initialization while pressing the ON/STAND_BY key even if the system is in the backup state.
- After the microcomputer is reset, set the port, modes, and register, then check each key.
 - * If the ON/STAND_BY key is pressed, perform the RAM ALL CLEAR operation for initialization.
 - * If the ON/STAND_BY key is not pressed, check whether the system is in the backup state.
 - * Pull out the AC power (set the POWER key to OFF) to destroy the backup data while pressing the ON/STAND_BY key.

3-2. INITIAL STAGE

NO	FUNCTION	MODEL		
		COMPO (KA-7090R)	KAF-7002	KAF-5002
1	ON/STAND-BY	SYSTEM OFF	SYSTEM OFF	SYSTEM OFF
2	INPUT SELECTOR	TUNER	TUNER	TUNER
3	REC OUT	REC MODE OFF (OFF)		
4	LOUDNESS	OFF	OFF	OFF
6	DIRECT		DIRECT OFF	DIRECT OFF
	SOURCE. DIR	OFF		
7	MD/MONITOR		OFF	OFF
9	MUTING	OFF	OFF	OFF

4. BACK UP DATA

WHEN STAND-BY

NO	DESIGNATION	MODEL		
		COMPO (KA-7090R)	KAF-7002	KAF-5002
2	INPUT SELECTOR	SELECTOR CONDITION	SELECTOR CONDITION	SELECTOR CONDITION
3	REC OUT	REC OUT POS		
4	LOUDNESS	ON/OFF CONDITION	ON/OFF CONDITION	ON/OFF CONDITION
6	DIRECT		DIRECT CONDITION	DIRECT CONDITION
	SOURCE. DIR	S. DIR CONDITION		
7	MD/MONITOR		ON/OFF CONDITION	ON/OFF CONDITION
9	MUTING	MUTE CONDITION	MUTE CONDITION	MUTE CONDITION

CIRCUIT DESCRIPTION

5. TEST MODE

5-1. Test Mode using Main Unit's Keys

- (1) Setting the test mode
 - Turn on the power while pressing the "LOUDNESS" key.
- (2) Canceling the test mode
 - To initialize the system and cancel the test mode, turn off the power.
- (3) Contents of test mode
 - The muting during mode selection is not controlled in the test mode. However, the operation when the power is turned on is the same as for the normal operation.
 - The speaker protection operation is also the same as for the normal operation.
- (4) Automatic POWER ON
 - The POWER ON state is entered for model discrimination whenever the power is turned on while pressing the "LOUDNESS" key. All the functions are then initialized and activated in the all-lighting mode.
 - In the all-lighting mode, the selector display LED lights sequentially. For KAF-7002/5002, the SOURCE DIRECT and CD DIRECT display LEDs light alternately. For KA-7090R, the SOURCE DIRECT display LED lights. The SP A and B display LEDs do not light. All other LEDs light.
 - The all-lighting mode is canceled when any of the main unit's keys is pressed. The normal display obtained when the selector is set to TUNER then appears.
- (5) Special operation
 - "LOUDNESS" key
 - (a) When this key is pressed, the LOUDNESS display LED lights and the electric volume turns up for 16 seconds. After 16 seconds, the electric volume stops and the display LED goes off.
 - (b) When this key is pressed during operation or after operation in step (a), the LOUDNESS display LED lights and the electric volume turns down for 16 seconds. After 16 seconds, the electric volume stops and the display LED goes off.
 - (c) When this key is pressed during operation in step (b), the LOUDNESS display LED goes off and the electric volume stops.
 - (d) The operation in step (a) is carried out when this key is pressed after operation in step (c). After that, the operation in steps (a) to (c) is repeated every time this key is pressed. The operation is not canceled even if another key is pressed while the electric volume turns up and down.
 - "SPEAKER A + B"

When the switch is set to this position, the SPEAKER A + B LED (for only the KA-7090R) lights and the audio mut-

ing is turned on. When the switch is set to another position, the LED goes off and the audio muting is turned off.

- "MD MONITOR" key (for only KAF-7002/5002)
When this key is pressed, the MUTE display LED lights and the audio muting is turned on. When this key is pressed again, the audio muting is turned off and the display LED goes off.
- "ATT. -30dB" key (for only KA-7090R)
When this key is pressed, the ATT. LED lights and the ATT. -30dB is turned on during normal operation. The REC muting is turned on while the REC OUT mode is set to ON. When this key is pressed again, the ATT. or REC muting is canceled and the ATT. LED goes off.
- "REC OUT" key (for only KA-7090R)
When this key is pressed, the REC OUT LED lights and the REC OUT mode is set to ON. The operation is not canceled until this key is pressed again. The REC muting is canceled if it is on when the operation is canceled.
- "8/16-bit selector switch" (for only KA-7090R)
The system enters the all-lighting mode if this switch is set to the 8-bit position when the ATT. key is on after the all-lighting mode is canceled. The serial POWER ON code is output at that time (code "25H" is output when the test mode is activated in the 8-bit position, and code "0800" is output when it is activated in the 16-bit position). The all-lighting mode is canceled when this switch is set to the 16-bit position again or when the ATT. key is pressed. The normal display then appears.

5-2. Serial Test Mode

- (1) Setting the test mode
 - The serial test mode is entered if a serial "71H" code is received only when the KA-7090R is in the 8-bit mode. After that, only the 16-bit mode is accepted. In other cases, the serial test mode is entered when a serial "C27FH" code is received.
- (2) Canceling the test mode
 - The serial test mode is canceled when a "C27FH" code is received. In this case, the system is not initialized. The serial code also remains set to the 16-bit position.
 - When the AC power (main power) is turned off, the serial test mode is canceled and the system is initialized.
- (3) Contents of test mode
 - The serial code for a test shown in the attached list is analyzed for processing.
 - In the test mode, no mute signal is output to shorten the input/output selection time during measurement. However, the operation when the power is turned on is the same as for the normal operation.
 - The speaker protection operation is also the same as for the normal operation. The code input in the test mode by serial communication is validated irrespective of the display mode.

KA-7090R

CIRCUIT DESCRIPTION

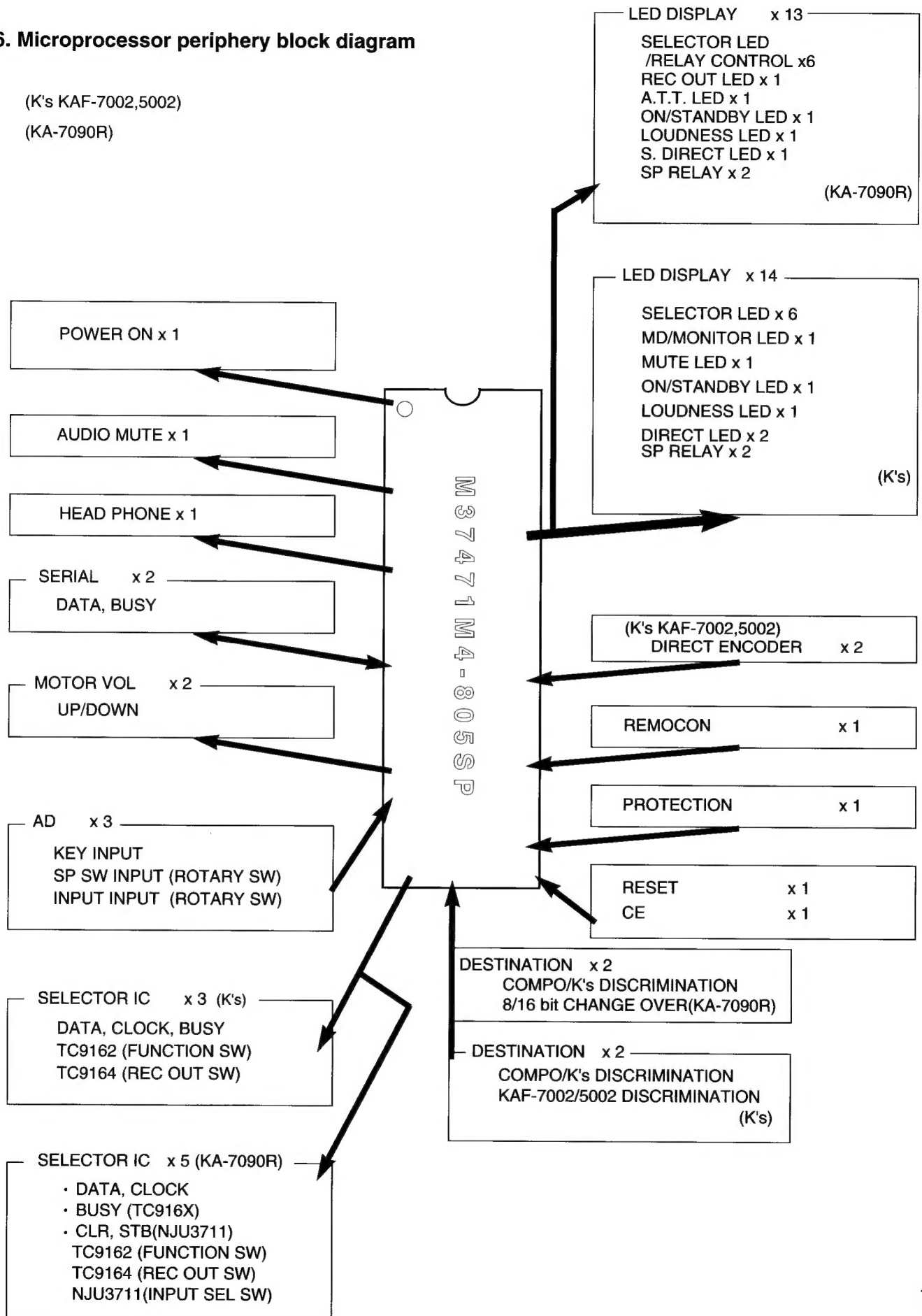
- The all-lighting mode is canceled using an all-lighting cancel code. After cancellation, the normal display appears.
- In the all-lighting mode, the selector display LED lights sequentially. For KAF-7002/5002, the SOURCE DIRECT and CD DIRECT display LEDs light alternately. For KA-7090R, the SOURCE DIRECT LED lights. The SPEAKER LED does not light. All other LEDs light.
- The REC OUT selector is operated by inputting the code of the selector after a REC MODE ON code is input (for only KA-7090R).
- The main unit's keys can be pressed even in the serial test mode. However, the operation is not guaranteed in this case.
- The operation when the code having a function not contained in the corresponding model is input is not guaranteed.
- The REC muting is canceled by MUTE ALL OFF.

CIRCUIT DESCRIPTION

6. Microprocessor periphery block diagram

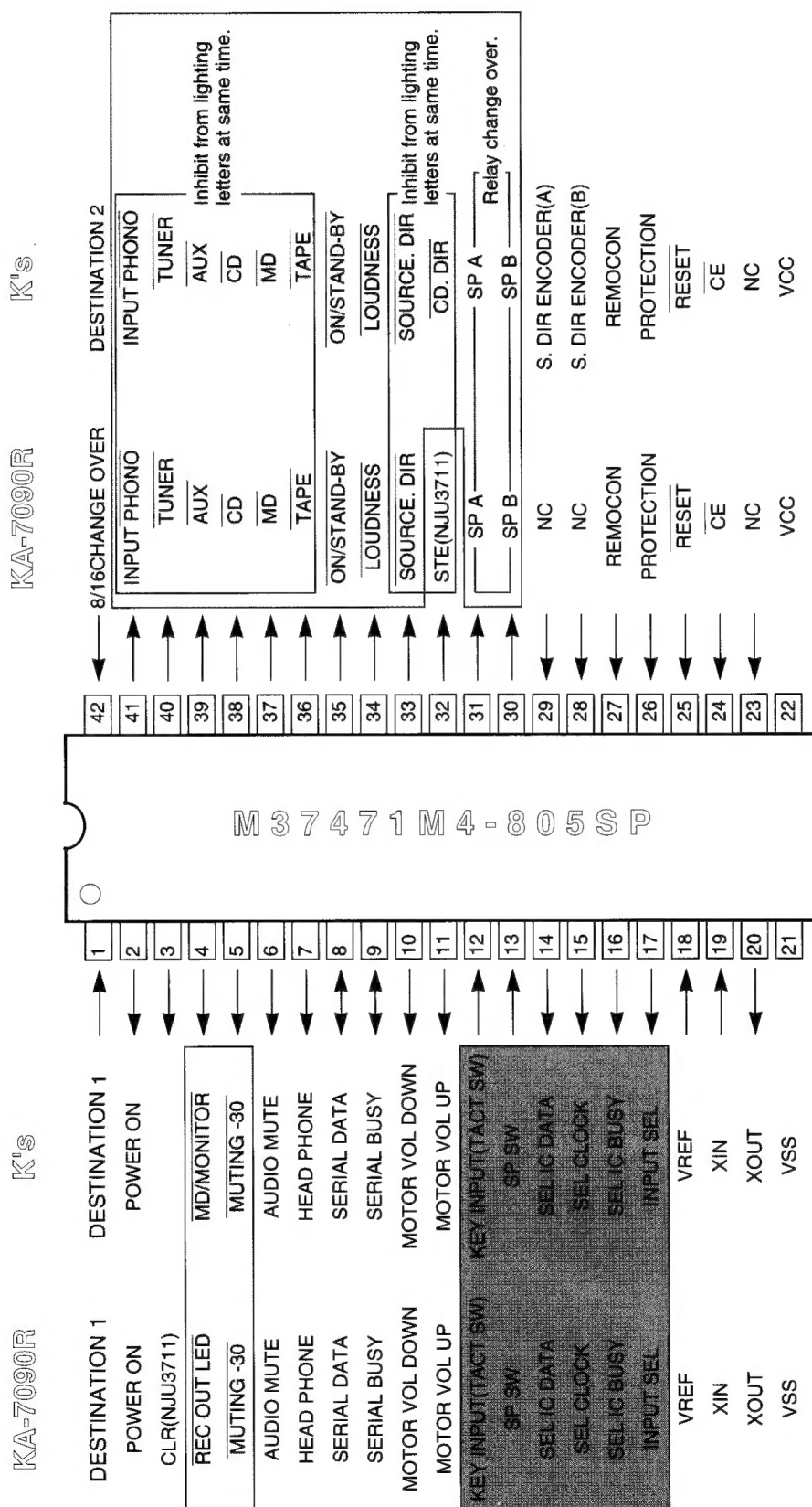
(K's KAF-7002,5002)

(KA-7090R)



CIRCUIT DESCRIPTION

6-1. Microprocessor pin connection



CIRCUIT DESCRIPTION

16bit serial test code (C2XXH)

TYPE FUNC	AMP							
	0	1	2	3	4	5	6	7
0	POWER OFF	CD DIRECT OFF						
1	POWER ON	CD DIRECT ON						
2	PHONO				MUTING OFF (-30dB)			MD MONITOR ON
3	CD				MUTING ON (-30dB)			MD MONITOR OFF
4	TUNER	SOURCE DIRECT OFF	MOTOR VOL UP					REC MODE ON
5		SOURCE DIRECT ON	MOTOR VOL DOWN					REC MODE OFF
6	TAPE2 (TAPE B)		MOTOR VOL STOP					REC OUT OFF POSITION
7	AUX						MD (INPUT)	
8		LOUDNESS OFF						
9		LOUDNESS ON						
A								
B							REC MUTE ON	ALL LEDS OFF
C								ALL LEDS ON
D	MUTE ON							AMP INITIAL
E								AMP SERIAL TEST OFF
F	MUTE ALL OFF							AMP SERIAL TEST ON

 : Sending code
  : Receiving code

CIRCUIT DESCRIPTION

6-2. Pin connection

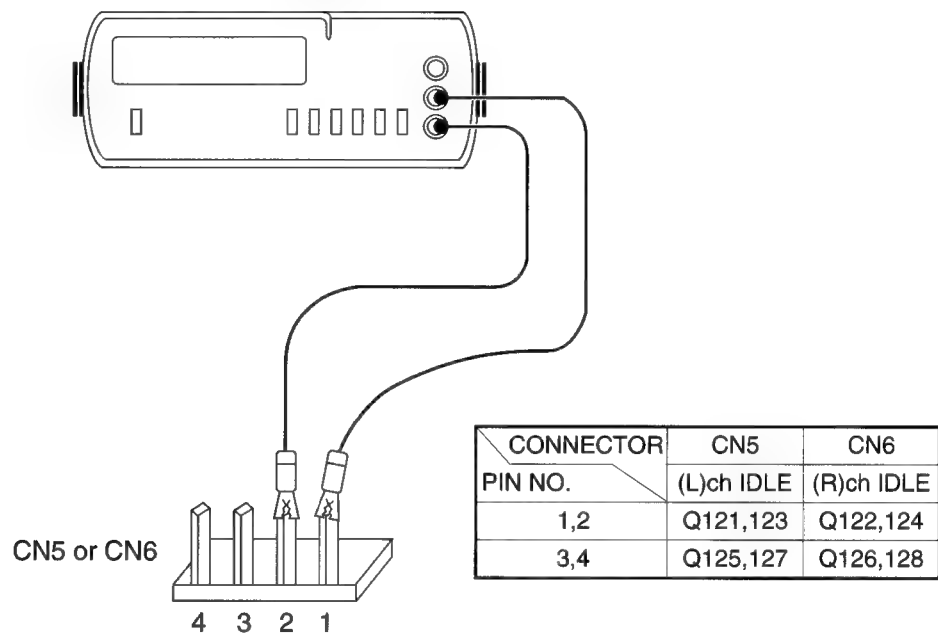
NO.	NAME	I/O	DESCRIPTION		
1	DESTINATION 1	I	COMPO/K's DISCRIMINATION PORT	H : COMPO	L : K's
2	POWER ON	O	POWER RELAY CONTROL TERMINAL	H : ON	L : OFF
3	COMPO CLR	O	CONTROL IC(NJU3711)CLR SIGNAL OUTPUT TERMINAL(KA-7090R)	H : ON	L : OFF
	K's NC	O	NOT USED	H : ON	L : OFF
4	COMPO REC OUT	O	"REC OUT" LED CONTROL TERMINAL (KA7090R)	H : OFF	L : ON
	K's MD MONITOR	O	"MD MONITOR" LED CONTROL TERMINAL	H : OFF	L : ON
5	MUTING-30	O	COMPO "A•T•T" LED RELAY CONTROL TERMINAL (KA-7090R)	H : OFF	L : ON
			K's "A MUTE" LED TERMINAL	H : OFF	L : ON
6	AUDIO MUTE	O	"MUTING" SIGNAL OUTPUT TERMINAL	H : ON	L : OFF
7	HEAD PHONES	O	HEAD PHONES CONTROL TERMINAL	H : ON	L : OFF
8	S DATA	I/O	SERIAL DATA		
9	S BUSY	I/O	SERIAL BUSY		
10	V DOWN	O	VOLUME DOWN SIGNAL OUTPUT TERMINAL	H : UP	L : OTHER
11	V UP	O	VOLUME UP SIGNAL OUTPUT TERMINAL	H : DOWN	L : OTHER
12	KEY (TACT)	I (A/D)	KEY INPUT TERMINAL	5 KEYS (KA-7090R)	
			KEY INPUT TERMINAL	5 KEYS (K's)	
13	SPEAKER SEL	I (A/D)	" SPEAKER SELECTOR " INPUT TERMINAL		
14	SEL IC DATA	O	SELECTOR IC DATA	H : I DATA	L : O DATA
15	SEL IC CLOCK	O	SELECTOR IC CLOCK	H : I DATA	L : O DATA
16	SEL IC ST	O	SELECTOR IC STROBE	H : I DATA	L : O DATA
17	INPUT SEL	I (A/D)	INPUT SELECTOR SW INPUT/CONTROL TERMINAL		
18	V REF	I	A/D REFERENCE VOLTAGE		
19	X IN	I	OSCILLATOR (8MHz)		
20	X OUT	O	OSCILLATOR (8MHz)		
21	VSS		GND		
22	VCC		+5V		
23	N/C	I	NOT USED		
24	CE	I	MICROPROCESSOR CHIP ENABLE	H : ENABLE	
25	RESET	I	RESET SIGNAL INPUT TERMINAL		
26	PROTECTION	I	PROTECTION DETECTION	H : ON	L : OFF
27	REMOCON IN	I	REMOTE CONTROL INPUT TERMINAL		
28	SOURCE.DIR B	I	COMPO → NOT USED K's ROTARY ENCODER B SIGNAL INPUT TERMINAL		
29	SOURCE.DIR A	I	COMPO → NOT USED K's ROTARY ENCODER A SIGNAL INPUT TERMINAL		
30	SP B	O	SPEAKER RELAY B CONTROL TERMINAL	H : ON	L : OFF
31	SP A	O	SPEAKER RELAY A CONTROL TERMINAL	H : ON	L : OFF
32		O	COMPO(NJU3711)CONTROL ST SIGNAL OUTPUT TERMINAL (KA-7090R)	H : OFF	L : ON
	CD DIR		K's "CD.DIR"LED CONTROL TERMINAL	H : OFF	L : ON
33	SOURCE DIR	O	"SOURCE.DIR"LED CONTROL TERMINAL	H : OFF	L : ON
34	LOUDNESS	O	"LOUDNESS" LED CONTROL TERMINAL	H : OFF	L : ON
35	ON/STANDBY	O	"ON/STANDBY" LED CONTROL TERMINAL	H : OFF	L : ON
36	INPUT TAPE	O	"TAPE" LED/RELAY CONTROL TERMINAL	H : OFF	L : ON
37	MD	O	"MD" LED/RELAY CONTROL TERMINAL	H : OFF	L : ON
38	CD	O	"CD" LED/RELAY CONTROL TERMINAL	H : OFF	L : ON
39	AUX	O	"AUX" LED/RELAY CONTROL TERMINAL	H : OFF	L : ON
40	TUNER	O	"TUNER" LED/RELAY CONTROL TERMINAL	H : OFF	L : ON
41	PHONO	O	"PHONO" LED/RELAY CONTROL TERMINAL	H : OFF	L : ON
42	COMPO 8/16	I	SERIAL 8/16 BIT DISCRIMINATION TERMINAL (KA-7090R)	H : 8	L : 16
	K's DESTINATION2	I	MODEL DISCRIMINATION TERMINAL	H : KAF-7002	L : KAF-5002

ADJUSTMENT

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
Unless otherwise specified, the individual switches should be set as following: POWER : ON SPEAKER : B REC OUT : OFF							
1	IDLE CURRENT	—	Connect a DC voltmeter between CN 5 (L) CN 6(R). (X09) (A/3)	VOLUME : 0	VR1,3 (L) VR2,4 (R) (X09) (A/3)	17.6 mV	(a)

(a)

DC VOLTMETER

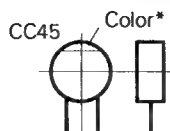


PARTS DESCRIPTIONS

CAPACITORS

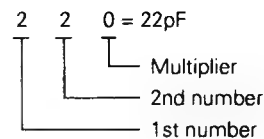
CC	45	TH	1H	220	J
1	2	3	4	5	6

- 1 = Type ... ceramic, electrolytic, etc.
 2 = Shape ... round, square, ect.
 3 = Temp. coefficient
 4 = Voltage rating
 5 = Value
 6 = Tolerance



• Capacitor value

- 010 = 1pF
 100 = 10pF
 101 = 100pF
 102 = 1000pF = 0.001μF
 103 = 0.01μF



• Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = -470 ± 60ppm/°C

• Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 -20	+80 -20	+100 -0	More than 10μF -10 ~ +50 Less than 4.7μF -10 ~ +75

(Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

• Voltage rating

2nd word 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	-

• Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
 1 2 3 4 5 6 7
 (Chip) (CH, RH, UJ, SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z
 1 2 3 4 5 6 7
 (Chip) (B, F)

1 = Type
 2 = Shape
 3 = Dimension
 4 = Temp. coefficient
 5 = Voltage rating
 6 = Value
 7 = Tolerance

Dimension (Chip capacitors)

Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0

RESISTORS

• Chip resistor (Carbon)

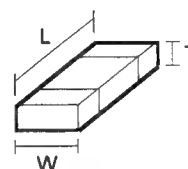
(EX) R K 7 3 E B 2 B 0 0 0 J
 1 2 3 4 5 6 7
 (Chip) (B, F)

• Carbon resistor (Normal type)

(EX) R D 1 4 B B 2 C 0 0 0 J
 1 2 3 4 5 6 7

- 1 = Type
 2 = Shape
 3 = Dimension
 4 = Temp. coefficient
 5 = Rating wattage
 6 = Value
 7 = Tolerance

Dimension



Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6 ± 0.2	0.8 ± 0.2	0.5 ± 0.1

Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

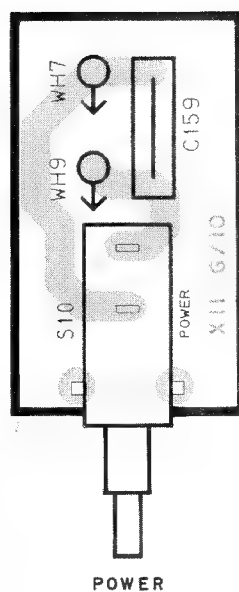


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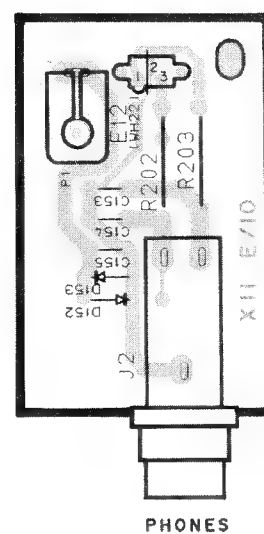


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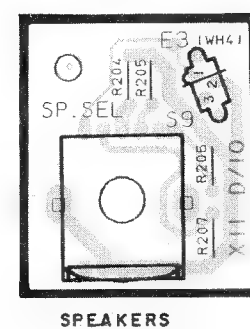
XII-368X-XX C/10
J70-0906-01



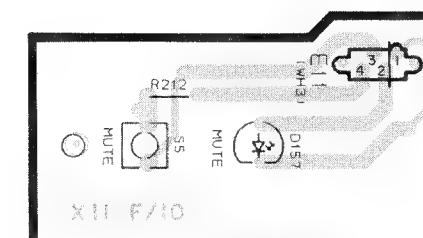
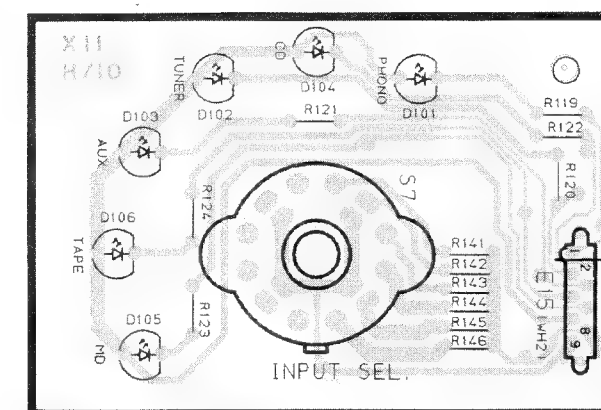
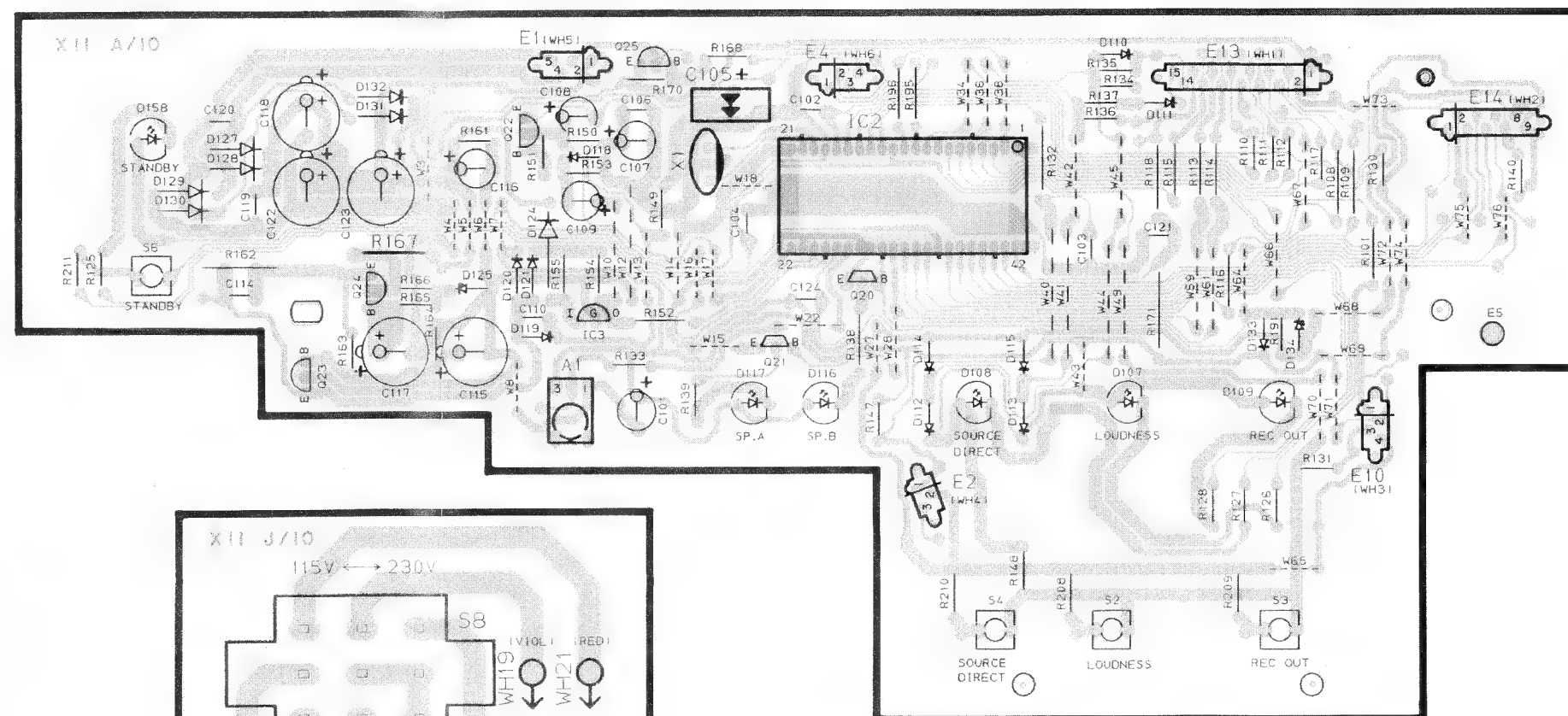
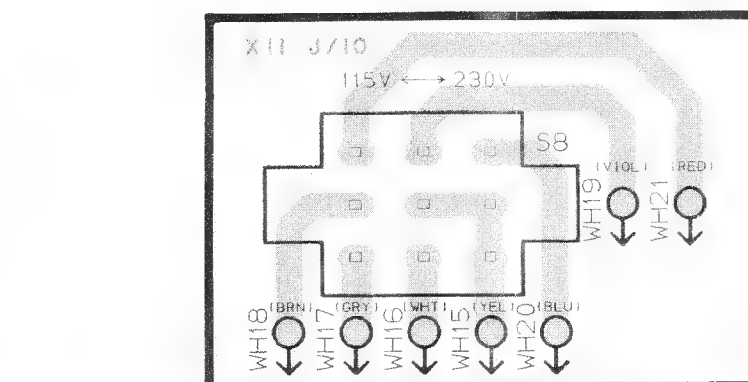
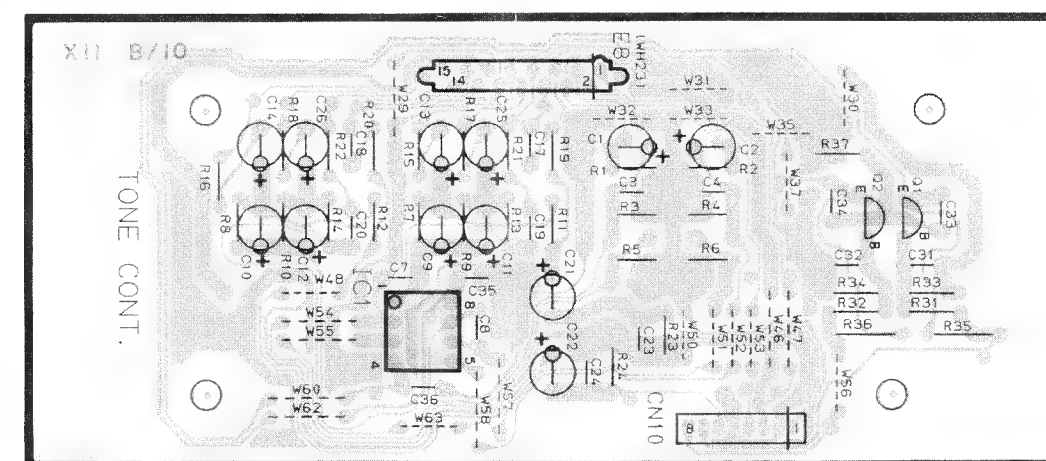
POWER

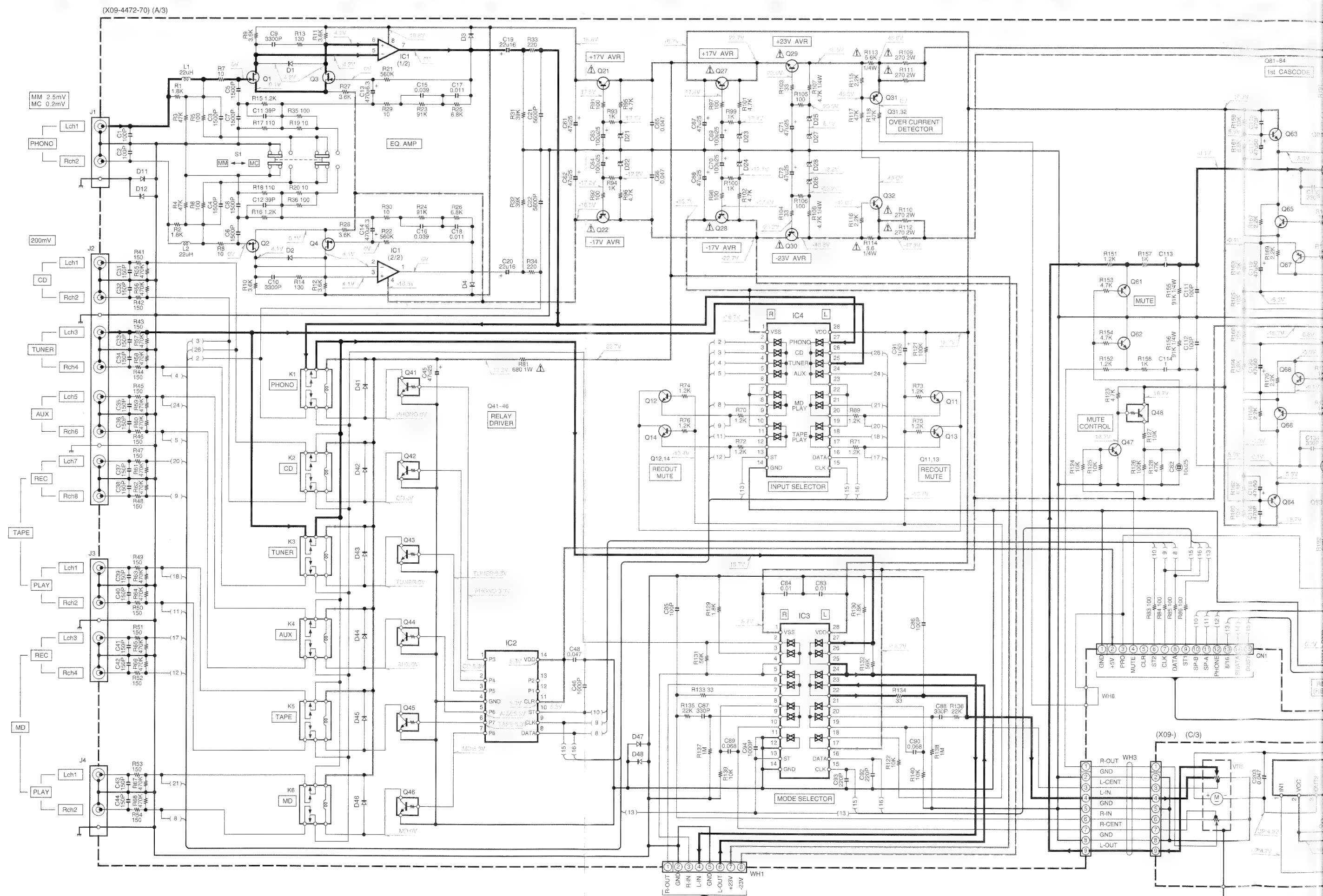


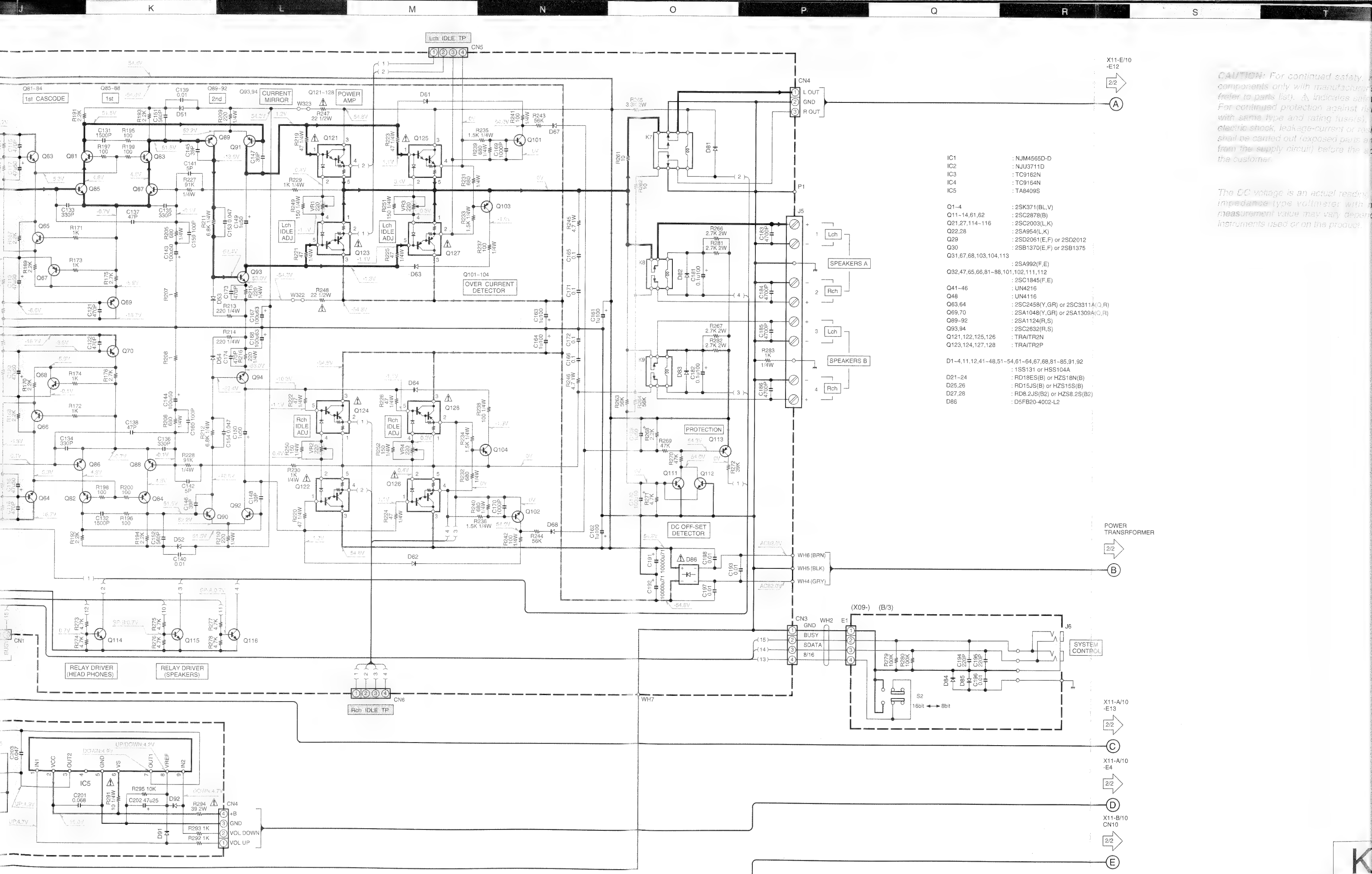
PHONES



SPEAKERS



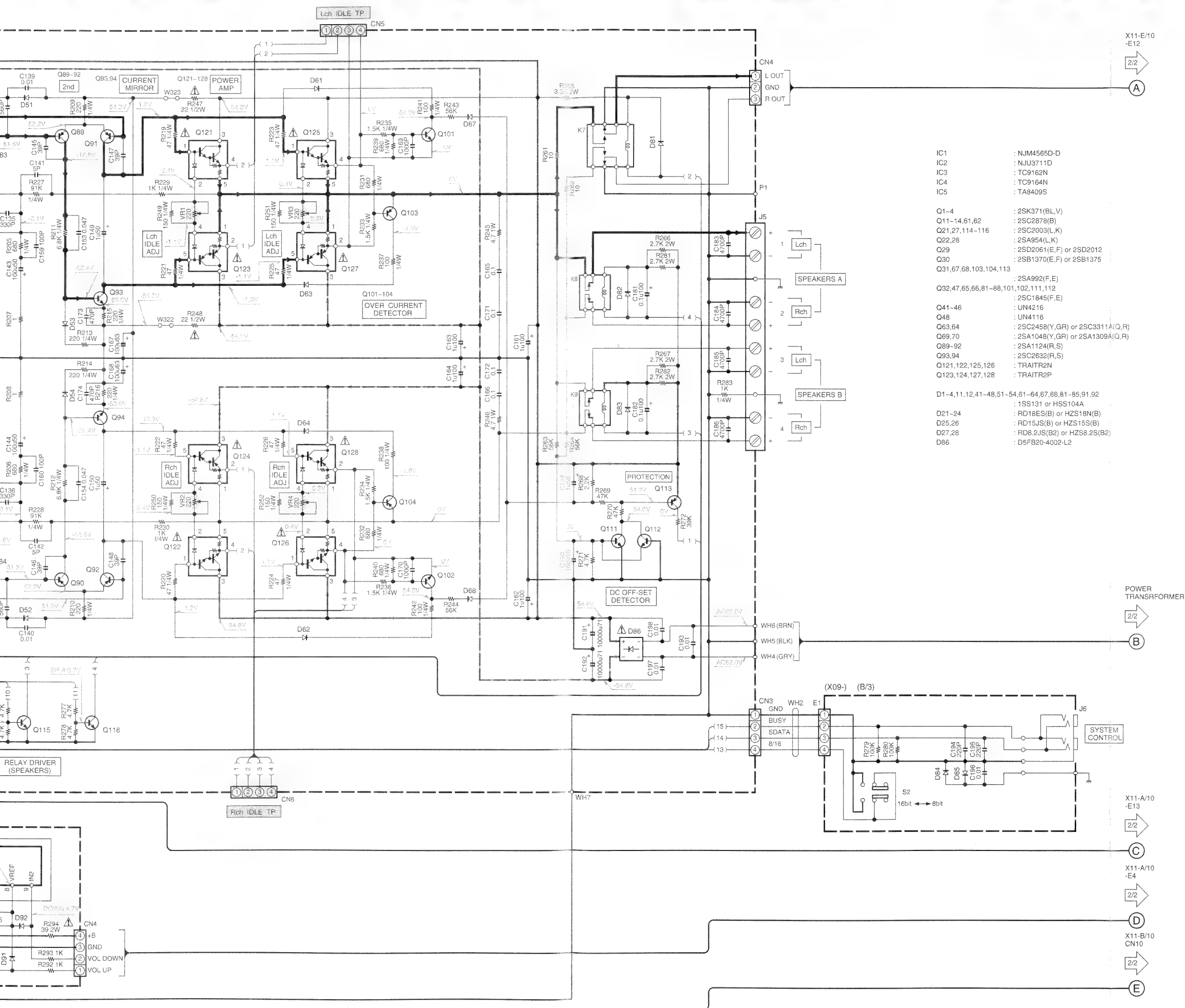




CAUTION: For continued safety, components only with manufacturer's (refer to parts list). A indicates safety. For continued protection against risk with same type and rating fuses, electric shock, leakage-current or risk shall be carried out (exposed parts from the supply circuit) before the customer.

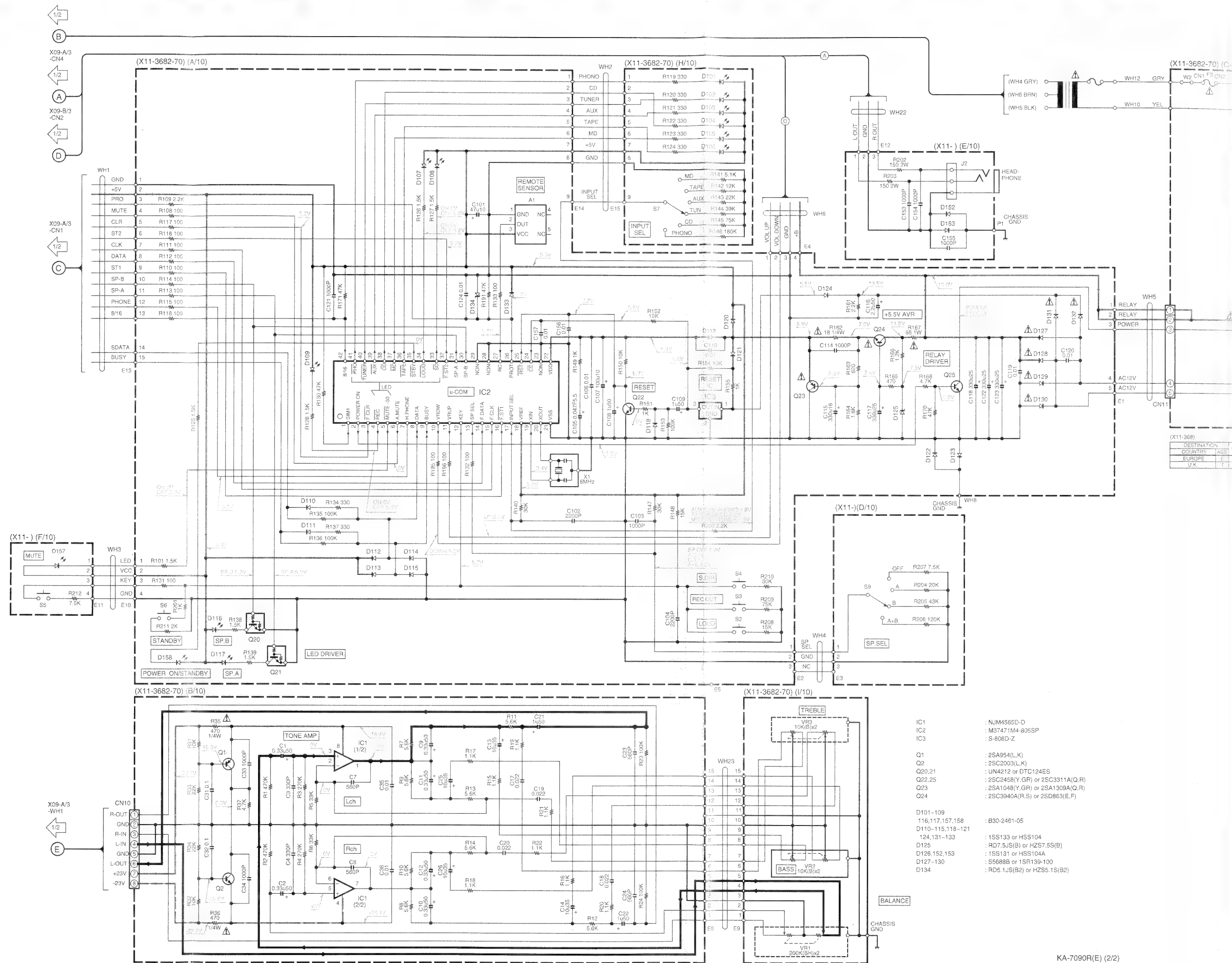
The DC voltage is an actual reading impedance-type voltmeter with measurement value may vary depend instruments used or on the product.

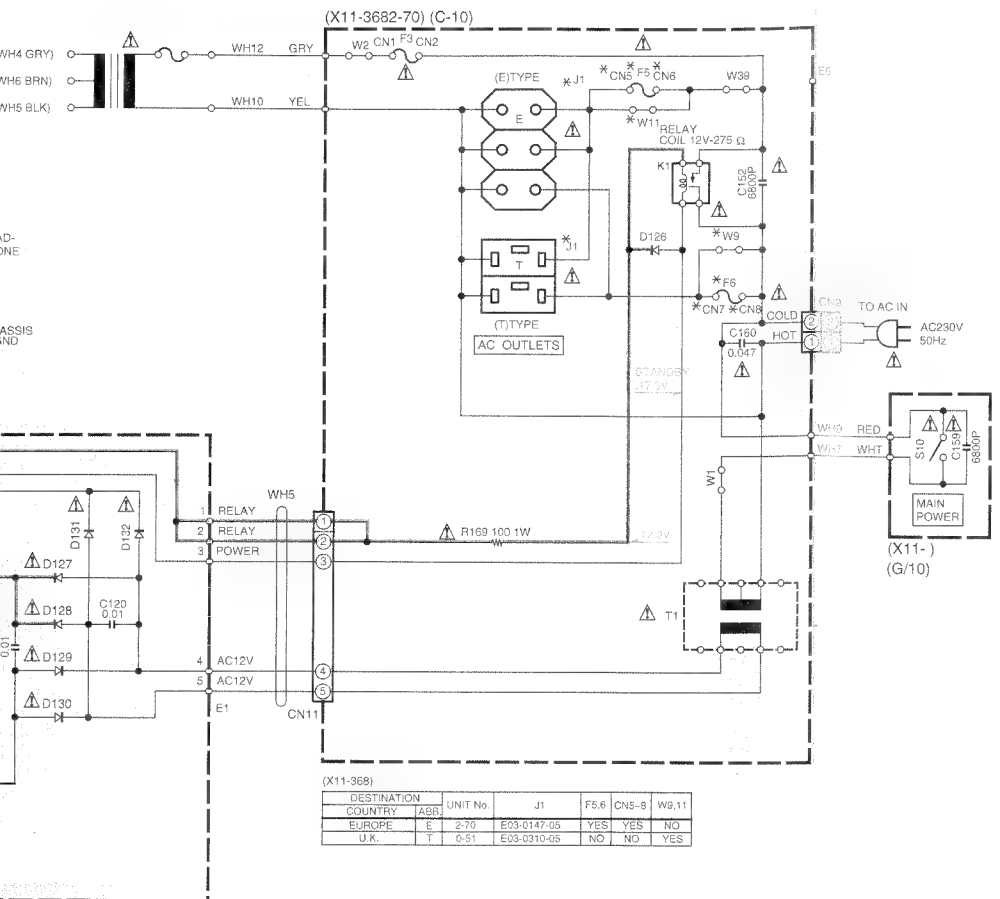
- | | |
|--|----------------------------------|
| IC1 | : NJM4565D-D |
| IC2 | : NJU3711D |
| IC3 | : TC9162N |
| IC4 | : TC9164N |
| IC5 | : TA8409S |
| Q1-4 | : 2SK371(BL,V) |
| Q11-14,61,62 | : 2SC2878(B) |
| Q21,27,114-116 | : 2SC2003(L,K) |
| Q22,28 | : 2SA954(L,K) |
| Q29 | : 2SD2061(E,F) or 2SD2012 |
| Q30 | : 2SB1370(E,F) or 2SB1375 |
| Q31,67,68,103,104,113 | : 2SA992(F,E) |
| Q32,47,65,66,81-88,101,102,111,112 | : 2SC1845(F,E) |
| Q41-46 | : UN4216 |
| Q48 | : UN4116 |
| Q63,64 | : 2SC2458(Y,GR) or 2SC3311A(Q,R) |
| Q69,70 | : 2SA1048(Y,GR) or 2SA1309A(Q,R) |
| Q89-92 | : 2SA1124(R,S) |
| Q93,94 | : 2SC2632(R,S) |
| Q121,122,125,126 | : TRA1R2N |
| Q123,124,127,128 | : TRA1R2P |
| D1-4,11,12,41-48,51-54,61-64,67,68,81-85,91,92 | : 1SS131 or HSS104A |
| D21-24 | : RD18ES(B) or HZS18N(B) |
| D25,26 | : RD15JS(B) or HZS15S(B) |
| D27,28 | : RD8.2JS(B2) or HZS8.2S(B2) |
| D86 | : D5FB20-4002-L2 |



CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Δ indicates safety critical components. For continued protection against risk of fire, replace only with same type and rating type(s). To reduce the risk of electric shock, leakage current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

The DC voltage is an actual reading measured with a high impedance type voltmeter with no signal input. The measurement value may vary depending on the measuring instruments used or on the product.





CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Δ indicates safety critical components. For continued protection against risk of fire, replace only with same type and rating fuse(s). To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

The DC voltage is an actual reading measured with a high impedance type voltmeter with no signal input. The measurement value may vary depending on the measuring instruments used or on the product.

2SA1124
2SA954
2SA992
2SC1845
2SC2003
2SC2632
2SC2878

2SC3940A
2SD863

DTC124ES
UN4116
2SA1048
2SC2458

2SB1370
2SD2061

UN4212
UN4216
2SA1309A
2SC3311A

2SB1375
2SD2012

NJM4565D-D

TA8409S

NJU3711D

2SK371

TC9162N
TC9164N

D-D
4-805SP
(L,K)
(L,K)
or DTC124ES
(Y,GR) or 2SC3311A(Q,R)
(Y,GR) or 2SA1309A(Q,R)
A(R,S) or 2SD863(E,F)
-05
r HSS104
B) or HZS7.5S(B)
r HSS104A
r 1SR139-100
B2) or HZS5.1S(B2)



A diagram of a three-wire cable. It consists of a cylindrical outer jacket with three conductors extending from one end. The conductors are labeled from left to right as E, C, and E.

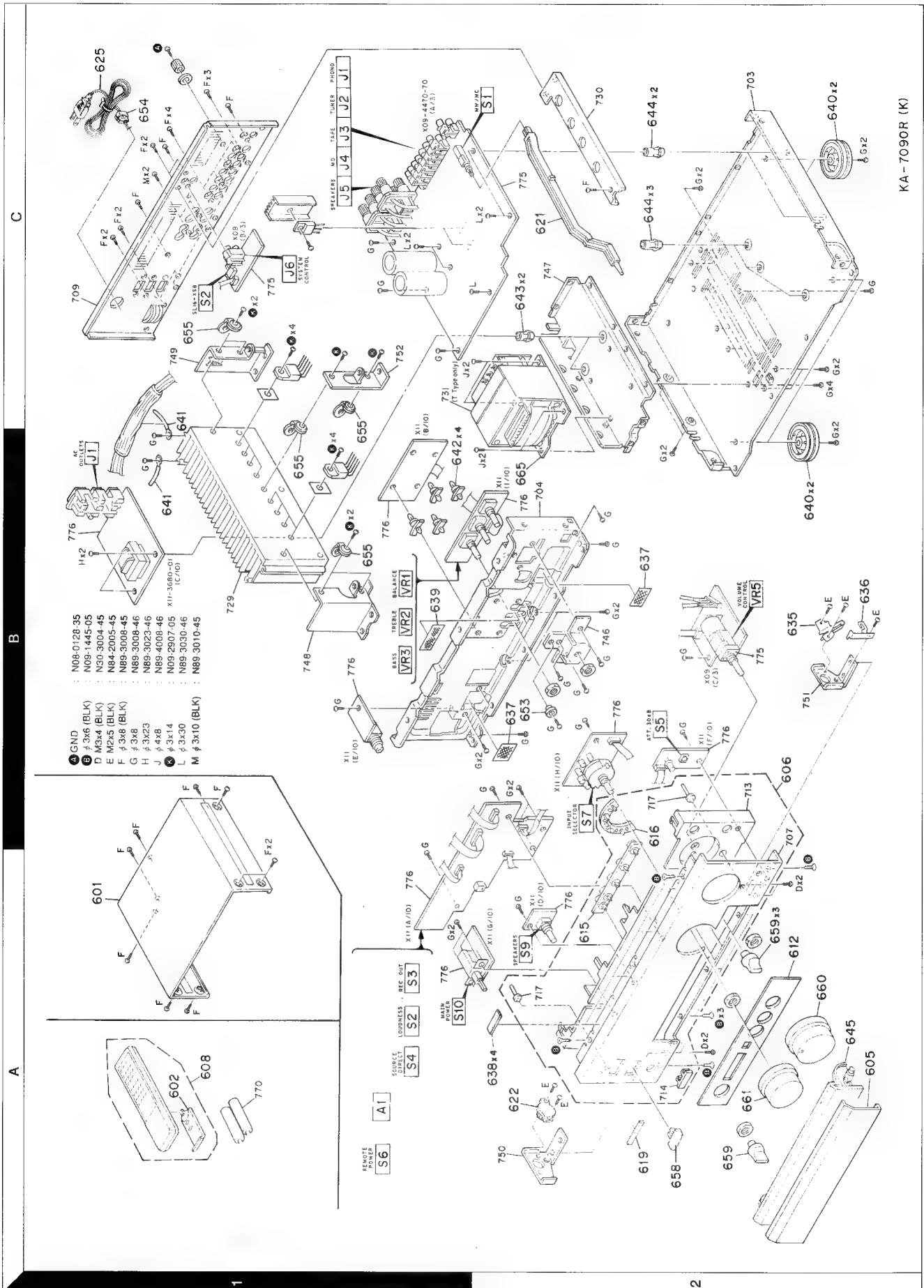
A diagram of a 4-pin connector. The connector has a rectangular body with four pins extending from it. The pins are labeled B, C, and D. Pin B is the leftmost, followed by C, and then D. There is a fourth pin on the right that is not labeled.

A diagram of a three-core cable. It consists of a rectangular outer jacket with three parallel cylindrical conductors extending from one end. The conductors are labeled from left to right as E, C, and E.

A diagram of a 5-pin D-sub connector. The pins are numbered 1 through 5. Pin 1 is the leftmost pin, pin 2 is next to it, pin 3 is in the middle, pin 4 is next to pin 3, and pin 5 is the rightmost pin. The connector is shown from a perspective view.

A diagram of a 28-pin DIP package. The package is shown from a perspective view. The pins are numbered 15 and 28. Pin 15 is at the top right, and pin 28 is at the bottom left.

EXPLODED VIEW (UNIT)



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C9, 10			CQ93FMG1H332J	MYLAR	
C11, 12			CC45FSL1H390J	CERAMIC	
C13, 14			CE04KWJ471M	ELECTRO	J
C15, 16			CQ93FMG1H393J	MYLAR	6.3WV
C17, 18			CQ93FMG1H113J	MYLAR	0.039UF
					0.011UF
C19, 20			CE04KW1C220M	ELECTRO	16WV
C21, 22			CQ93FMG1H562J	MYLAR	5600PF
C31, 44			CC45FSL1H151J	CERAMIC	150PF
C45			CE04KW1E470M	ELECTRO	47UF
C46, 47			CQ93FMG1H102J	MYLAR	1000PF
C48			CQ93FMG1H473J	MYLAR	0.047UF
C61, 62			CE04KW1E470M	ELECTRO	47UF
C63, 64			CE04KW1E101M	ELECTRO	100UF
C65, 66			CQ93FMG1H473J	MYLAR	0.047UF
C67, 68			CE04KW1E470M	ELECTRO	47UF
C69, 70			CE04KW1E101M	ELECTRO	100UF
C71, 72			CE04KW1E470M	ELECTRO	47UF
C82			CE04HW1E100M	NP-ELEC	10UF
C83, 84			CQ93FMG1H103J	MYLAR	0.010UF
C85, 86			CC45FSL1H101J	CERAMIC	100PF
C87, 88			CC45FSL1H331J	CERAMIC	330PF
C89, 90			CQ93FMG1H683J	MYLAR	0.088UF
C91			CE04KW1H010M	ELECTRO	1.0UF
C92, 93			CC45FSL1H221J	CERAMIC	220PF
C94			CC45FSL1H102J	CERAMIC	1000PF
C111, 112			CC45FSL1H101J	CERAMIC	100PF
C113, 114			C91-1549-05	MF-C	1.0UF
C115, 116			CQ93FMG1H471J	MYLAR	470PF
C117-120			CE04KW1H470M	ELECTRO	470PF
C121, 122			CQ93FMG1H471J	MYLAR	470PF
C131, 132			CQ93FMG1H152J	MYLAR	1500PF
C133-136			CC45FSL1H331J	CERAMIC	330PF
C137, 138			CC45FSL1H470J	CERAMIC	47PF
C139, 140			CQ93FMG1H103J	MYLAR	0.010UF
C141, 142			CC45FSL1H050C	CERAMIC	5.0PF
C143, 144			CE04KW1H101M	ELECTRO	100UF
C145-148			C91-1469-05	FILM	39PF
C149, 150			CE04KW1H010M	ELECTRO	1.0UF
C151, 152			CC45FSL1H561J	CERAMIC	560PF
C153, 154			CQ93FMG1H473J	MYLAR	0.047UF
C159, 160			CC45FSL1H101J	CERAMIC	100PF
C161-164			CE04KW2A010M	ELECTRO	1.0UF
C165, 166			CQ93FMG1H104J	MYLAR	0.10UF
C167, 168			CE04DW1J101M	ELECTRO	100UF
C169, 170			CQ93FMG1H102J	MYLAR	1000PF
C171, 172			CQ93FMG1H104J	MYLAR	0.10UF
C173, 174			CQ93FMG1H471J	MYLAR	470PF
C181, 182			CE04KW2A010M	ELECTRO	0.1UF
C183-186			CQ93FMG1H472J	MYLAR	4700PF
C189			CE04KW1H010M	ELECTRO	1.0UF
C190			CE04KW1A101M	ELECTRO	100UF
C191, 192			C90-3624-05	ELECTRO	10000UF
C193			CK45FE2H103P	CERAMIC	0.010UF
C194, 195			CC45FSL1H221J	CERAMIC	220PF
C196			CK45FF1H103Z	CERAMIC	0.010UF

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KA-7090R					
601	1A	*	A01-3333-21	METALLIC CABINET	
602	1A	*	A09-0170-08	BATTERY COVER	
605	2A	*	A52-0308-03	DOOR	
606	2B	*	A60-0944-12	PANEL ASSY	
608	1A	*	A70-1079-05	REMOTE CONTROLLER ASSY	
612	2A	*	B03-2972-13	DRESSING PLATE	
615	2A	*	B12-0295-04	INDICATOR	
616	2A	*	B12-0296-04	INDICATOR	
619	2A	*	B43-0302-04	KENWOOD BADGE	
			B46-0310-03	WARRANTY CARD	
		*	B58-0965-13	CAUTION CARD	
		*	B58-0966-13	CAUTION CARD	
		*	B60-2805-00	INSTRUCTION MANUAL	
		*	B60-2807-00	INSTRUCTION MANUAL	
621	2C	*	D21-1844-03	EXTENSION SHAFT	
622	2A	*	D39-0200-05	DAMPER	
625	1C	*	E30-2788-05	AC POWER CORD	
625	1C	*	E30-2791-05	AC POWER CORD	
635	2B	*	G02-1011-04	FLAT SPRING	
636	2B	*	G02-1601-04	FLAT SPRING	
637	2B	*	G10-0154-04	NON-WOVEN FABRIC	
638	2A	*	G11-0155-14	SOFT TAPE (40X9X2)	
639	1B	*	G10-0179-04	NON-WOVEN FABRIC	
		*	H10-7211-02	POLYSTYRENE FOAMED FIXTURE	
		*	H10-7212-02	POLYSTYRENE FOAMED FIXTURE	
		*	H11-0074-04	POLYSTYRENE FOAMED BOARD	
		*	H12-2302-04	PACKING FIXTURE	
		*	H25-0232-04	PROTECTION BAG (235X350X0.03)	
		*	H25-0319-04	PROTECTION BAG	
		*	H25-0651-04	PROTECTION BAG	
		*	H25-0657-04	PROTECTION BAG	
		*	H50-2036-14	ITEM CARTON CASE	
		*	H50-2037-14	ITEM CARTON CASE	
640	2B, 2C	*	J02-1147-13	FOOT (D=46, H=18.5)	
641	1B	*	J19-0306-05	LEAD HOLDER	
642	1B	*	J19-3325-05	UNIT HOLDER	
643	2C	*	J19-3690-04	UNIT HOLDER	
644	2C	*	J19-3730-04	UNIT HOLDER	
645	2A	*	J19-5691-12	HOLDER	
653	2B	*	J39-0198-04	SPACER	
654	1C	*	J42-0085-05	POWER CORD BUSHING	
655	1B, 1C	*	J42-0331-04	BUSHING	
		*	J61-0098-05	WIRE BAND	
658		*	K27-2176-04	KNOB (BUTTON)	
659		*	K29-3759-14	KNOB	
660		*	K29-6390-04	KNOB	
661		*	K29-6391-04	KNOB	
665		*	L07-2156-05	POWER TRANSFORMER	
AUDIO (X09-4472-70)					
C1, 2			CC45FSL1H101J	CERAMIC	
C3, 8			CQ93FMG1H152J	MYLAR	
				100PF	J
				1500PF	J

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C197, 198			CK45FE2H103P	CERAMIC	
C201			CQ93FMG1H683J	MYLAR	0.010UF P
C202			CE04KW1E470M	ELECTRO	0.068UF J
C203			CQ93FMG1H473J	MYLAR	47UF 25WV J
CN1			E40-4609-05	PIN ASSY	
CN2, 3			E40-4294-05	FLAT CABLE CONNECTOR	
CN4			E40-4293-05	FLAT CABLE CONNECTOR	
CN5, 6			E40-4873-05	PIN ASSY	
J1			E63-0099-05	PHONO JACK	
J2			E63-0098-05	PHONO JACK	
J3			E63-0102-05	PHONO JACK	
J4			E63-0099-05	PHONO JACK	
J5			E70-0063-05	SCREW TERMINAL BOARD	
J6			E11-0293-05	MINIATURE PHONE JACK	
E2, 3			J11-0808-05	WIRE CLAMPER	
L1, 2			L40-2201-17	SMALL FIXED INDUCTOR(22UH,K)	
R23, 24			RN14BK2C9102FU	RN	91.0K F 1/6W
R25, 26			RN14BK2C6801FU	RN	6.80K F 1/6W
R81			RS14KB3A681J	FL-PROOF RS	680 J 1W
R107, 108			RD14NB2E472J	RD	4.7K J 1/4W
R109-112			RS14KB3D271J	FL-PROOF RS	270 J 2W
R113, 114			RD14NB2E5R6J	RD	5.6 J 1/4W
R209, 210			RD14NB2E221J	RD	220 J 1/4W
R213-216			RD14NB2E221J	RD	220 J 1/4W
R219-226			RD14NB2E470J	RD	47 J 1/4W
R231, 232			RD14NB2E821J	RD	820 J 1/4W
R233-236			RD14NB2E152J	RD	1.5K J 1/4W
R237, 238			RD14NB2E101J	RD	100 J 1/4W
R239, 240			RD14NB2E821J	RD	820 J 1/4W
R241, 242			RD14NB2E101J	RD	100 J 1/4W
R245, 246			RS14KB3A4R7J	FL-PROOF RS	4.7 J 1W
R247, 248			RD14KB2H220JKW	RD	22 J 1/4W
R249-252			RD14NB2E151J	RD	150 J 1/4W
R265			RS14KB3D332J	FL-PROOF RS	3.3K J 2W
R266, 267			RS14KB3D272J	FL-PROOF RS	2.7K J 2W
R281, 282			RS14KB3D272J	FL-PROOF RS	2.7K J 2W
R283			RN14BK2E1001FU	RN	1.00K F 1/4W
R291			RD14NB2E100J	RD	10 J 1/4W
R294			RS14KB3D390J	FL-PROOF RS	39 J 2W
VR1 -4			R31-0010-05	TRIMMING POT.(220 Ω-)	
VR5				VARIABLE RESISTOR	
K1 -6			S76-0027-05	MAGNETIC RELAY	
K7			S76-0028-05	MAGNETIC RELAY	
K8, 9			S51-2092-05	MAGNETIC RELAY	
S1			S68-0064-05	PUSH SWITCH	
S2			S62-0034-05	SLIDE SWITCH	
D1 -4			HSS104A	DIODE	
D1 -4			1SS131	DIODE	
D11, 12			HSS104A	DIODE	
D11, 12			1SS131	DIODE	
D21 -24			HZS18N(B)	ZENER DIODE	
D21 -24			RD18ES(B)	ZENER DIODE	
D25, 26			HZS15S(B)	ZENER DIODE	

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D25, 26			RD15JS(B)	ZENER DIODE	
D27, 28			HZS8,2S(B2)	ZENER DIODE	
D27, 28			RD8,2JS(B2)	ZENER DIODE	
D41 -48			HSS104A	DIODE	
D41 -48			1SS131	DIODE	
D51 -54			HSS104A	DIODE	
D51 -54			1SS131	DIODE	
D61 -64			HSS104A	DIODE	
D61 -64			1SS131	DIODE	
D67, 68			HSS104A	DIODE	
D67, 68			1SS131	DIODE	
D81 -85			HSS104A	DIODE	
D81 -85			1SS131	DIODE	
D86			D5FB20-4002-L2	DIODE	
D91, 92			HSS104A	DIODE	
D91, 92			1SS131	DIODE	
IC1			NJM4565D-D	IC(OP AMP X2)	
IC2			NJU3711D	IC(8BIT I/O EXPANDER)	
IC3			TC9162N	IC(ANALOG SWITCH ARRAY)	
IC4			TC9164N	IC(16CH BILATERAL SELECTOR SW)	
IC5			TA8409S	MOS-IC	
Q1 -4			2SK371(BL,V)	FET	
Q11 -14			2SC2878(B)	TRANSISTOR	
Q21			2SC2003(L,K)	TRANSISTOR	
Q22			2SA954(L,K)	TRANSISTOR	
Q27			2SC2003(L,K)	TRANSISTOR	
Q28			2SA954(L,K)	TRANSISTOR	
Q29			2SD2012	TRANSISTOR	
Q30			2SD2061(E,F)	TRANSISTOR	
Q30			2SB1370(E,F)	TRANSISTOR	
Q30			2SB1375	TRANSISTOR	
Q31			2SA992(F,E)	TRANSISTOR	
Q32			2SC1845(F,E)	TRANSISTOR	
Q41 -46			UN4216	DIGITAL TRANSISTOR	
Q47			2SC1845(F,E)	TRANSISTOR	
Q48			UN4116	DIGITAL TRANSISTOR	
Q61, 62			2SC2878(B)	TRANSISTOR	
Q63, 64			2SC2458(Y,GR)	TRANSISTOR	
Q65, 66			2SC3311A(Q,R)	TRANSISTOR	
Q67, 68			2SC1845(F,E)	TRANSISTOR	
Q69, 70			2SA992(F,E)	TRANSISTOR	
Q81 -88			2SA1048(Y,GR)	TRANSISTOR	
Q89 -92			2SA1309A(Q,R)	TRANSISTOR	
Q93, 94			2SC1845(F,E)	TRANSISTOR	
Q101, 102			2SC2632(R,S)	TRANSISTOR	
Q103, 104			2SC1845(F,E)	TRANSISTOR	
Q111, 112			2SA992(F,E)	TRANSISTOR	
Q113			2SC1845(F,E)	TRANSISTOR	
Q114-116			2SC2003(L,K)	TRANSISTOR	
Q121, 122			TRATOR2P	TRANSISTOR	
Q123, 124			TRATOR2P	TRANSISTOR	
Q125, 126			TRATOR2P	TRANSISTOR	
Q127, 128			TRATOR2P	TRANSISTOR	

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Ref. No.	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
Δ T1		*	L07-2195-05	POWER TRANSFORMER		
Δ X1			L78-0290-05	RESONATOR (8MHZ)		
Δ R35,36			RN14BK2E4700FU	470.0		F 1/4W
Δ R162			RD14NB2E180J	18		J 1/4W
Δ R167			RS14KB3A680J	68		J 1W
Δ R169			RS14KB3A101J	100		J 1W
Δ R202,203			RS14KB3D151J	150		J 2W
Δ VR1		*	R31-0072-05	VARIABLE RESISTOR		
Δ VR2,3		*	R31-0071-05	VARIABLE RESISTOR		
Δ K1			S76-0044-05	MAGNETIC RELAY		
Δ S2,6			S70-0031-05	TACT SWITCH		
Δ S7		*	S60-0032-05	ROTARY SWITCH		
Δ S9		*	S60-0035-05	ROTARY SWITCH		
Δ S10		*	S40-1138-05	PUSH SWITCH (POWER TYPE)		
Δ D110-115			HSS104	DIODE		
Δ D110-115			ISS133	DIODE		
Δ D118-121			HSS104	DIODE		
Δ D118-121			ISS133	DIODE		
Δ D122,123			HSS104A	DIODE		
Δ D122,123			ISS131	DIODE		
Δ D124			HSS104	DIODE		
Δ D124			ISS133	DIODE		
Δ D125			HZS7,5S(B)	ZENER DIODE		
Δ D125			RD7,5J(SB)	ZENER DIODE		
Δ D126			HSS104A	DIODE		
Δ D126			ISS131	DIODE		
Δ D127-130			S6688B	DIODE		
Δ D127-130			1SR139-100	DIODE		
Δ D131-133			HSS104	DIODE		
Δ D131-133			ISS133	DIODE		
Δ D134			HZS5,1S(B2)	ZENER DIODE		
Δ D134			RD5,1J(SB2)	ZENER DIODE		
Δ D152,153			HSS104A	DIODE		
Δ D152,153			ISS131	DIODE		
Δ IC1		*	NUM4565D-D	IC(OP AMP X2)		
Δ IC2			M37471M4-805SP	MI-COM IC		
Δ IC3			S-806D-Z	ANALOGUE IC		
Δ Q1			2SA954(L,K)	TRANSISTOR		
Δ Q2			2SC2003(L,K)	TRANSISTOR		
Δ Q20,21			DTC124ES	DIGITAL TRANSISTOR		
Δ Q20,21			UN4212	DIGITAL TRANSISTOR		
Δ Q22			2SC2458(Y,GR)	TRANSISTOR		
Δ Q22			2SC3311A(Q,R)	TRANSISTOR		
Δ Q23			2SA1048(Y,GR)	TRANSISTOR		
Δ Q23			2SA1309A(Q,R)	TRANSISTOR		
Δ Q24			2SC3940A(R,S)	TRANSISTOR		
Δ Q24			2SD863(E,F)	TRANSISTOR		
Δ Q25			2SC2458(Y,GR)	TRANSISTOR		
Δ Q25			2SC3311A(Q,R)	TRANSISTOR		
Δ A1			W02-2537-05	ELECTRIC CIRCUIT MODULE		

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CONTROL (X11-3682-70)						
Δ D101-109			B30-2461-05	LED(RED.5)		
Δ D116,117			B30-2461-05	LED(RED.5)		
Δ D157,158			B30-2461-05	LED(RED.5)		
Δ C1,2			CE04KW1H33M	0.33UF		50WV
Δ C3,4			CC45FSL1H331J	330PF		J
Δ C7,8			CC45FSL1H561J	560PF		J
Δ C9,12			CE04KW1H33M	0.33UF		50WV
Δ C13,14			CE04KW1V100M	10UF		35WV
Δ C17,20			CO93FMG1H223J	0.022UF		J
Δ C21,22			CE04KW1H010M	1.0UF		50WV
Δ C23,24			CO93FMG1H561J	560PF		J
Δ C25,26			CE04KW1V100M	10UF		35WV
Δ C31,32			CO93FMG1H104J	0.10UF		J
Δ C33,34			CO93FMG1H102J	1000PF		J
Δ C35,36			CO93FMG1H103J	0.010UF		10WV
Δ C101			CE04KW1A470M	47UF		J
Δ C102			CO93FMG1H222J	2200PF		J
Δ C103			CO93FMG1H102J	1000PF		J
Δ C104			CO93FMG1H222J	2200PF		J
Δ C105			C90-1826-05	BACKUP-C		5.5WV
Δ C106			CO93FMG1H103J	0.047F		J
Δ C107			CE04KW1A101M	0.010UF		10WV
Δ C108,109			CE04KW1H010M	1.0UF		50WV
Δ C110			CO93FMG1H103J	0.010UF		J
Δ C114			CO93FMG1H102J	1000PF		J
Δ C115			CE04KW1C331M	330UF		16WV
Δ C116			CE04KW1H2R2M	2.2UF		50WV
Δ C117,118			CE04DW1E331M	330UF		25WV
Δ C119			CO93FMG1H103J	0.010UF		J
Δ C120			CK45FF1H103Z	0.010UF		Z
Δ C121			CO93FMG1H102J	1000PF		J
Δ C122,123			CE04DW1E331M	330UF		25WV
Δ C124			CK45FF1H103Z	0.010UF		Z
Δ C124			CO93FMG1H102J	1000PF		J
Δ C152			C91-1488-05	MF		250VAC
Δ C153,154			CO93FMG1H102J	6800PF		J
Δ C155			MF-C	1000PF		J
Δ C157,158			CK45FF1H103Z	0.010UF		Z
Δ C159			C91-1488-05	MF		250VAC
Δ C160			C91-1444-05	MF		250VAC
Δ CN9			E40-4245-05	PIN ASSY		
Δ CN10			E40-3252-05	PIN ASSY		
Δ CN11			E40-4295-05	FLAT CABLE CONNECTOR		
Δ J1			E03-0147-05	AC OUTLET		
Δ J1			E03-0310-05	AC OUTLET		
Δ J2			E11-0271-05	PHONE JACK (METAL SLEEVE)		
Δ F3			F06-2021-05	FUSE (SEMKO) (250V T2AL)		
Δ F5,6			F05-2525-05	FUSE (SEMKO) (250V T2.5AL)		
Δ CN1,2			J13-0075-05	FUSE CLIP		
Δ CN5,8			J13-0075-05	FUSE CLIP		
Δ E5,6			J11-0808-05	WIRE CLAMPER		

L: Scandinavia K: USA P: Canada R: Mexico
Y: FX(Far East, Hawaii) T: Europe E: Germany G: Mexico
V: AAFES(Europe) X: Australia M: Other Areas

Δ indicates safety critical components.

SPECIFICATIONS

Continuous rated output
(DIN/IEC)

4 Ω 150 W + 150 W
 8 Ω 90 W + 90 W

(IEC) 20 Hz to 20,000 Hz, 0.05 % T.H.D.

4 Ω 115 W + 115 W
 8 Ω 85 W + 85 W

Total harmonic distortion

.....0.02 % (20 Hz ~ 20 kHz, 45 W, 8 Ω)
0.005 % (1 kHz, 45 W, 8 Ω)

Damping factor250 (50 Hz)

Frequency response

LINE (CD, TAPE TUNER, AUX, MD)

.....5 Hz ~ 100 kHz, +0 dB, -3 dB

PHONO 'RIAA' response ..20 Hz ~ 20 kHz, +0.3 dB, -0.3 dB

Maximum input level

PHONO (MM)120 mV, 0.3 % T.H.D. at 1 kHz
 PHONO (MC)10 mV, 0.3 % T.H.D. at 1 kHz

Signal to noise ratio (IHF 66')

PHONO (MM)88 dB
 PHONO (MC)68 dB
 LINE (CD, TAPE TUNER, AUX, MD)105 dB

TONE CONTROL

BASS ± 10 dB (100 Hz)TREBLE ± 10 dB (10 kHz)

LOUDNESS control (VOLUME at -30 dB level)

.....+6 dB (100 Hz)

.....+3 dB (10 kHz)

Input sensitivity/impedance

PHONO (MM)2.5 mV/47 k Ω PHONO (MC)0.2 mV/100 Ω LINE (CD, TAPE TUNER, AUX, MD)200 mV/47 k Ω

Output level/impedance

TAPE REC200 mV/1.5 k Ω MD REC200 mV/1.5 k Ω

GENERAL

Power consumption300 W

AC outlet

SWITCHED2 (total 95 W max.)

UNSWITCHED1 (100 W max.)

DimensionsW : 440 mm

H : 147 mm

D : 392 mm

Weight (net)11.7 kg



KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.